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THE
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Rail Road News.

Ohio and Pennsylvania Railroad.

Gen. Wm. Robinson, Jr., the President of the Company, and Solomon W. Roberts, Esq., the Chief Engineer, have concluded an arrangement for eleven thousand tons of railroad iron, of 60 lbs. per yard, which is sufficient to complete the road from Pittsburgh to Massillon on the Ohio canal. It will also accomplish the connection with Cleveland. From Pittsburgh to Beaver and Brighton the road will be laid with American rails, made at the Brady's Bend Iron Works, in Armstrong County, and the line is to be ready for use in July of next year and the remainder of the road to Massillon some time next season. As soon as passengers are able to go through from Philadelphia to Pittsburgh in the cars, they will be able to proceed upon a continuous railway to Cleveland, Columbus and Cincinnati.

Pacific Railroad.

The St. Louis Intelligencer learns from Mr. Allen, Persident of the Pacific Railroad Company, that the Chief Engineer has returned to that city from his reconnoisance of the entire route from St. Louis to the western borders of the State. The ground is found as favorable as was expected, and the road it is said, can be constructed at a very reasonable cost. A large force will be placed on the road early in the ensuing Spring, and it is believed that from 50 to 100 miles of the work will be completed next year.

The Toronto and Lake Huron Railroad.

The Rochester Daily Democrat says that the Messrs. Wood have offered to build this road, taking £150,000 of stock themselves, if £150,000 of reliable subscriptions can be obtained.

Cleveland and Pittsburg Railroad.

This Ohio railroad is progressing rapidly. It is nearly all graded and the rails are now being laid down. Two locomotives have been shipped for it from Taunton, Mass.

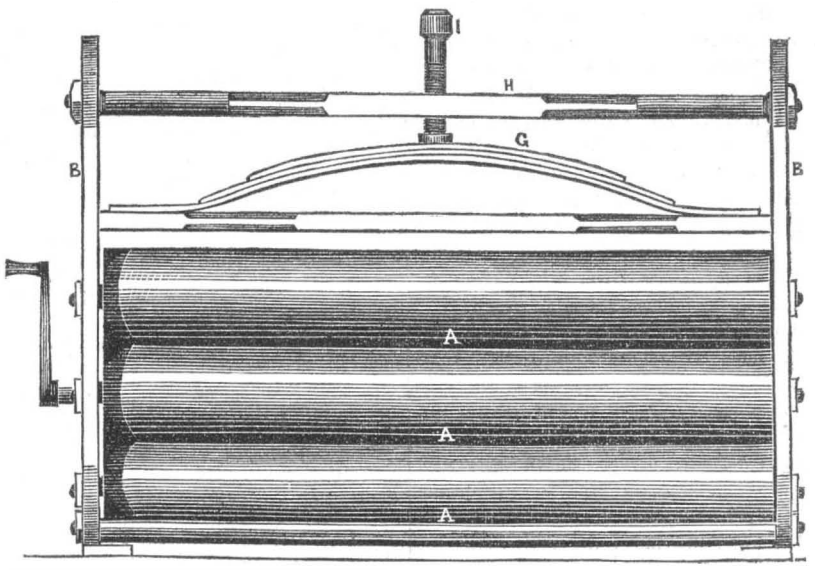
The New Albany and Salem Railroad, commencing at New Albany, Indiana, will run through Salem, Bedford, Bloomington and Gosport, to Crawfordsville, and there connect with the road to Lafayette. A branch is also contemplated from Gosport to Indianoplis, The stock now amount to $760,000, of which $355,000 has been collected.

Bite of an Alligator.

Abner Smith, from Massachusetts, took three alligators from Louisiana to Cincinnati, for the purpose of exhibiting them. On Wednesday of last week, one of them bit him on the arm, and a terrible inflamation supervening, he died in the hospital on the following Sabbath.

New Orleans Picayune speaks of a sample of cotton grown in Upper California, which is a great curiosity. The cotton is of a very long staple, and of excellent quality; the bolls are large, and the cotton of a fine color.

IMPROVED DOMESTIC MANGLE.---Figure 1.



The engravings we here present, are those of an improved domestic mangle, for mangling clothes. The use of a mangle is extensive in our cities, but not in our villages. It is an old machine of itself and a very useful one, but the majority of our people are not acquainted with it. Our object is to bring its qualities and uses before all our people, in every city, village and hamlet. Its office is to mangle or press clothes between weighted rollers, to smooth and put a beautiful finish on them. During our warm season, when light colored clothes are so generally worn, there is not a single village of two thousand inhabitants but should have a public mangle, and in our farmer's families such machines should form part of the domestic furniture.

FIG. 2.

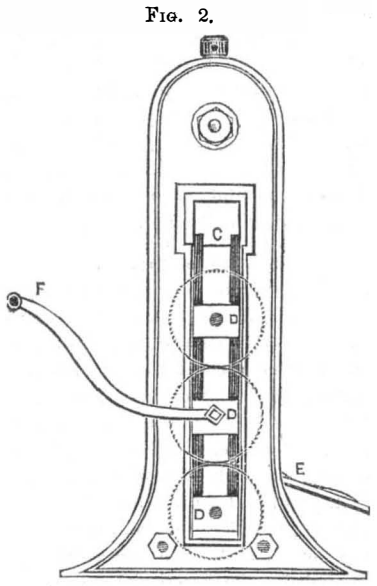


Figure 1 is a front elevation, and figure 2 is a side view. The same letters refer to like parts. It is made of two sides, B B, which may be formed of cast iron, where it can be got cheap, or it may be made of wood, and any farmer can make one himself. The sides are made with a vertical slot, C, down the middle, into which the journals of the rollers, A A A, play in their boxes, D D D, (fig. 2.) The rollers are made of wood turned in a lathe. E is the feed board; F is the crank handle on the outside of the journal of the middle roller. G is an elliptical spring, like a coach spring, fixed on a bar running across from one side to the other, and its ends rest upon the bearing box, D, of the upper roller. The tension of this spring upon the bar, and consequently upon the rollers, is regulated by the screw, I, passing through the top brace, H, and pressing upon the convex centre of the spring. The feed board, E, is attached to the two sides of the mangle, sloping upwards to a line of junction with the lower and middle rollers. Upon this board is spread a sheet of clean linen, and it is tacked by the ends or by one edge to the middle roller. The articles to be mangled are laid upon this sheet, and motion being given to the central roller by the handle, F, they are carried in and compressed between the whole of the three rollers. Any degree of pressure may be given to the rollers by the spring. The reason why the rollers working the slots with their journals, is to allow them to rise and fall to mangle thicker and thinner clothes, and the spring enables any degree of pressure desired to be put upon the rollers, so as simply to press the clothes smoothly, or to mangle them with a beautiful gloss. All the parts of this machine are made strong, and for a few dollars every household may have a machine which will last for years. In the old mangles no spring like G was used. A weighted strap over the gudgeon of the upper roller was used to vary the pressure. The spring is altogether a good improvement. For pressing sheets, white pants, and such like clothes, as much work can be done in two hours, and far better done, and no fire required, than could be done by the sad-iron in a whole day.

A Rascal of a Savan.

M. Sibri, a well known French savan and member of the Institute of France, and a Professor, has been tried for thefts of valuable manuscripts and books committed in the public Libraries of France. He protested his innocence on the accusation being made originally, and not making his appearence, he was condemned by default, to ten years' imprisonment. This sentence is what the French laws call a *peine aflictif et infiamante*, and consists in strict confinement with hard labor, in the House of Correction. His library was valued at 600,000f.; his salary, was 4000, and originally he had nothing. He did a wholesale business of plundering. From the Bibleotheque Mazarine he took 150 valuable manuscripts; at Troys, nineteen works of the Middle ages, &c.

Another Planet.

The new Planet Parthenope, discovered by M. Gasparis, of Naples, was observed at the National Observatory, Washington, by Mr. J. Ferguson, on the nights of the 11th, 13th and 14th instant, with the filar-micrometer of the large equatorial. This is the eleventh in the family of Asteroids, and the seventh that has been discovered within the last four years. It resembles a star of the tenth magnitude.

Useful Receipts.

For Vegetarians.

MACCARONI SOUP.—To 4 oz. of maccaroni, 1 quart of new milk, 1 quart of water, 1 large onion, and 1 oz. of the crumb of stale bread.—Soak the maccaroni for two hours; put it into the milk and water when boiling, add the bread, onion and salt, and boil all slowly until quite soft, then rub it through the sieve twice over, returning it into the pan, adding more seasoning, and either ¼ of a pint of cream, or ½ oz. of butter; let it just boil, and serve with toasted bread.

CARROT SOUP.—The red part of 2lbs. of carrots, 1½ oz. of onions, half pint of cream, and 3 quarts of water. Add the carrot and onion to the water when boiling; boil them till thoroughly soft, and rub them through a hair sieve; then return the soup to the pan, add the cream and seasoning, and allow it to simmer, (but not to boil,) for two minutes. Serve with toasted bread.

TURNIP HASH.—¾ lb. of turnips, ¾lb. of potatoes; 2 table-spoonsful of flour; 2 oz. of butter; 1 large onion, and a table-spoonful of salt. Put three quarts of water into a well tinned pan, set it over the fire, put in the turnips cut into small square pieces, and the onion cut small, add the salt and let it boil for an hour, then put in the potatoes, also cut in pieces, and after boiling ¾ of an hour longer add the butter. Rub the flour in ¼ pint of cold water until perfectly smooth, pour it into the pan and let it boil slowly ¼ of an hour longer, when the liquid part of the hash will be of the consistency of thin butter sauce. It will be sufficiently boiled in two hours, and should be covered the whole time.

SAVOURY FRITTERS.—5 oz. of onion; 1 teaspoonful of powdered sage; 4 eggs, and 4 oz of stale bread. Soften the bread thoroughly in a dish, with a little boiling water, covering it over and letting it soak for an hour, then mash it up with a fork, picking out the hard pieces; boil the onion in two or three waters, till quite soft, then chop it small adding the powdered sage, a little pepper and salt, and the eggs, well beaten; mix this intimately with the bread, and fry the whole in fritters, serving with brown sauce, and apple sauce.

BAKED SAVOURY OMELET.—Same as savoury fritters, except being baked whole, in a buttered dish.

MINCE TARTS.—6 good sized lemons, a lb. of apples, 1 lb. of raisins, stoned, 1 lb. of currants, 1 lb. of sugar, ¾ of a lb. of butter, and paste. Squeeze out the juice of the lemons, scrape out the pulp and skins, boil the rinds till quite tender, changing the water 5 or 6 times to take out the bitterness; chop them in a bowl with the apples and raisins; add the currants, sugar, the juice of the lemons, the butter, melted, and stir it up well with the other ingredients. To preserve—Put the whole close down in a pot, and tie a paper over it, and keep in a dry cool place; it will remain good 6 or 7 weeks. A little cayenne, mace, and candied orange or lemon, may be added if approved.

CHEESCAKES.—2 oz. of butter, 1 lb. of loa sugar, broken; 6 eggs, 2 lemons, paste. Put the sugar, eggs (leaving out two whites), the rinds of two lemons, grated, the juice of three lemons, to the butter, in a brass pan, and simmer over the fire till the sugar becomes dissolved, and the whole begins to thicken like honey. It must be stirred all the time it is on the fire. To preserve—Pour into jars and tie close, keeping in a dry place.

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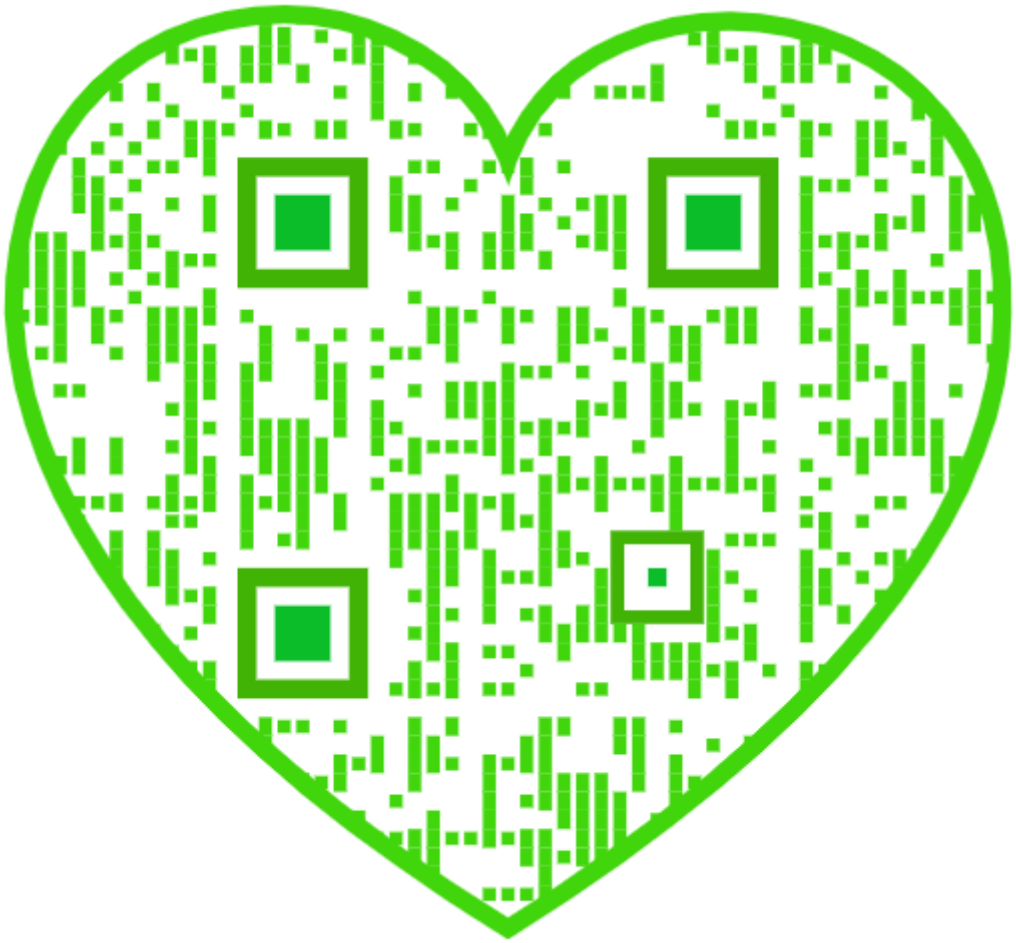

Miscellaneous.

America.

Frazer's (London) Magazine, in a late review of Sir Charles Lyell's book upon America, in which review a very different tone prevails from what formely marked the comments of the British periodicals upon the United States, thus speaks of the probable future of this country:

We are not all suprised at what in this country is most foolishly called the conceit and vanity of the Americans. What people in the world have so fine, so magnificient a country? besides that, they have some reason to be proud of themselves. We have given the chief features of their eastern and inland territory; if the reader has any imagination for ideas of this kind, let him picture to himself what will be the aspect of things when the tide of population has crossed the long range of the Rocky Mountains, and occupying the valleys of the Western coast, has built other Bostons and New Yorks in the harbors of Oregon and California. This tide of population is now advancing along a line of more than a thousand miles, at the rate of eighteen miles a year; and each year, as the population behind becomes larger, the number of new settlers is increased, and the rate of advance is accelerated. This vast crowd of ever-onward pressing settlers is not formed of the same materials as the inhabitants of an European province, that is, there are not at its head a few intelligent but delicately brought-up men of capital, while all the rest are ignorant laborers; but handle the axe and the rifle, and can "calculate." If ever these magnificient dreams of American people are realized—and all that is wanted for their realization is that things should only go on as they have been going on for the last two centuries—there will be seated upon that vast continent a population greater than that of all Europe, all speaking the same language; all active minded, intelligent and well off.—They will stand as it were, the centre of the world, between the two great oceans, with Europe on one hand and Asia on the other.—With such a future before him, we must pardon the Yankee if we find a little dash of self-complaceney in his composition; and bear with the surprise and annoyance which he expresses at finding that we know so little of himself or of his country. Our humble opinion is that we ought to know better.

Great as is the influence which America has already had upon Europe, we conceive that this is a mere intimation of the influence which it is destined to have upon world.

Remarks on Diet.

Important as is the kind of food, the quantity is of still greater importance. An Englishman on returning home from a visit to America, being asked what he thought of the Yankees, replied: "Their men are all gluttons; and their women all slaves;" nowise complimentary to either sex; but is there not much truth in what he said?

The theory and practice of Dr. Cheyne was: "The lightest and least of meats and drinks a person can be tolerable easy under, is the shortest and most infallible means to preserve life, health and serenity." Those who feel an indisposition to take physical or mental exercise, immediately after meals, have eaten too much, and are exhausting, through their stomachs, energy due to the brain and muscles, and the power of the former is diminished by being overtasked. Hence, the greatest eaters are often thin in flesh, receiving less nourishment from a larger quantity of food than the vigorous digestive powers of moderate eaters extract from a much smaller amount. When any extraordinary effort is to be made, physically or mentally, the best preparation is rigid abstemiousness. Let those who would possess sound minds in sound bodies, and the greatest degree of intellectual power and moral excellence of which they are susceptible, keep a guard over appetite, and pursue their onward course with minds untrammelled and spirits free.—[American Agriculturist.

[If any Englishman ever made the above remarks they were certainly false, and afford no ground for advice. The Americans are more temperate in eating and drinking than the English, and our women are less slaves than the females of any country on the face of the wide globe. We hear much about gluttony and eating and drinking. It is our opinion that gluttony is not so common a *disease* as starvation.

Iron Business of Northern New York.

Although the field of operation is not so large, yet the magnitude of the Iron business of Northern New York and the mineral capabilities of that region, are probably less understood than any other section of our country. A Mr. Carter has recently made a report, on the subject of a railroad on the west side of Lake Champlain, which sheds a flood of light on the matter. Mr. Carter confines himself to Essex and Clinton counties. The first estimate in relation to the Iron trade of the two counties embraces the following table, purporting to show the number of forge fires within their respective territories:

Forges on Saranac River with 45 fires for operation; on Salmon River, 16 fires for do.; on Little Ausable, 9; on Great Ausable, 60; on Bouquet, 12; on other rivers, 20. Total 162. These, when in full operation, are capable of producing 45,000 tons of iron per annum.

These fires are, except some 10 or 12, now in operation, and are capable of producing six tons per week; but to allow for lost time by low water on some of the smaller streams, if we call the average product five tons per fire, weekly, the amount per year is 38,740 tons, nearly as much as the report estimate for both counties.

There are also in Essex county five blast furnaces, capable of producing ten tons of pig iron per day, of which no account is made in the estimate above referred to. There is a small experimental furnace in operation at the Adriondack Works, capable of producing about two tons per day, which is made into steel by the process, and a furnace is now in course of erection there, which will yield probably ten tons per day, to be used for the same purpose. Summing up the products of the various establishments, we have the following as the aggregate:

Great Ausable and Essex Co., 149 fires, 38,740 tons; Saranac and streams in Clinton Co., estimated in the report, 70 fires, 19,845 tons; 7 blast furnaces in Essex Co., 19,344 tons. Total, 77,929 tons. By this estimate it appears that the present erections in the two counties are capable of producing about 80,000 tons of iron per annum, a very large portion of which would make its egress to market over the contemplated railroad.

Cabbage Prevents Drunkenness.

It is singular fact that cabbage is a sovereign remedy for intoxication from wine, and that it has even the power of preventing it; for we are informed, by eating a certain quantity of cabbage before dinner, we may drink as much wine as we please, without experiencing any inconvenience. The property of the cabbage is mentioned by ancient writers, who are of opinion that it proceeds from the antipathy which the vine shows to the cabbage; if a cabbage be planted near a vine, the latter either retires or dies. But we think the whole story doubtful.

[Who believes the above? No man of common observation; and yet there is a great deal of truth in it, when rightly applied. It is done as follows:—all those who have a penchant for drinking wine to excess after dinner, are recommended to eat five cabbages and drink a gallon of water beforehand.

Iron for Car Wheels.

Mr. Robinson, (whose advertisement appears in another column) has, after a series of experiments, succeeded in producing a quality of iron not surpassed by any other article in the world.

A villainous attempt was made to fire the Astor House on the night of the 16th. A young man named Grandjean was arrested as the incendiary; his father kept a perfumery store on the ground floor of the building.

Quadrature of the Circle.

This is a subject which has engaged the attention of the most splendid mathematicians in every age, who have universally given up the question in despair, at least so far as rational numbers are concerned. But all have not been disheartened by the ever failing attempts of former philosophers to *square the circle*. We have recently seen a work on this subject by Mr. Peter Fleming, of Montreal, C. E., a profound mathematician, and author of "A System of Surveying, and a method of base line by angular observation." Mr. Fleming says, "all attempts heretofore made to demonstrate the ratio of the circumference and diameter by numbers, have only approximated to the result by a decimal of six or seven figures, but that which may be incommensurable to numbers, it is well known, may be commensurable in geometry. The ancient problems, therefore, are still open to investigation by geometry, for when the length of a given circle can be resolved into a straight line, the quadrature of the circle is accomplished." The solution of this problem, Mr. Fleming lays before the public in his work, which contains 10 lemmas and 12 solutions of the nine figures demonstrating the theorems. Mr. Fleming made the first report of railroads in the United States, and surveyed the first railroad in this State. He is a veteran Civil Engineer, and his work deserves the attention of Engineers, Professors and Students. It is sold by Mr. Gowan, Fulton street, New York.

Leonard's Mechanical Principia.

We would call the attention of our readers to this eminently useful work, not that we have it for sale, as will be found on our advertising page, but because we have received so many letters about a work of this kind, which had to be answered, and we wish to make this notice, answer for a general answer to many correspondents. The work is by Mr. Chas. Elbridge Leonard, of the Matteawan Machine Shop. It embraces calculations on water and steam power, and on the different kinds of machinery used in manufacturing, &c. It has a table of calculations on water power, which is invaluable, as giving the tables of power for overshot, breast wheel and turbines, both inside and outside discharging ones. Here is one question about the centre vent turbine, which will show what it is:—"Required the horse power of an inward discharging turbine wheel, the head being 14 feet and the area of all the openings 300 feet."—The answer is set forth in tables of a ready-reckoner form as 30 horse power. The power to drive mill stones, saws, and the machinery in a cotton factory, is all tabled. We know of no book more useful and indispensable to the mechanic and manufacturer.

Scientific Voyage.

The Mobile Tribune notices the sailing from that port of Professor Tuomy, the State Geologist of Alabama, on a private scientific voyage around the coast of Southern Florida accompained by several other men of scientific abilities, to ascertain whether the marine flora of the waters between Florida and Cuba is almost identical with that of the straits of Gibraltar, as has been asserted. They intend also to pay particular attention to geology, meteorolgy, &. of that region, the geography of the everglades, the practicability of draining them, the value of the hammock lands, and whether they will prove permanently productive upon culture, or, as some persons assert, fail on account of the porous nature of the subsoil, or, more properly, the sand—and the consequent sinking of the surface soil, after being put into cultivation.

Unpaid Letters.

Number of letters uncalled for in the New York post office, since the act reducing the tax on letters went into effect, 554,993. The consequent loss, including charges for advertising, is estimated at $61,000. It would appear from this that, in order to make the system of cheap postage safe to the government, and to justify a further reduction, it will be necessary to provide that all letters shall be pre-paid. The best system of postage is prepayment of all letters and the price of each not to exceed two cents for 500 miles.

Great Inland Voyage.

The St. Louis papers of the 8th inst. announce the arrival of the steamer El Passo, chartered by Messrs. P. Chouteau, Jr. & Co. for the transportation of men and goods to their forts in the Indiana country. She went three hundred and fifty miles above the Mouth of the Yellow Stone. The account says:

Our freight and the traders were all landed here. A board bearing the following inscription, was fixed on a tree by the passengers:—"The steamer El Passo landed at this point on the 20th of June, 1850, thirty-five days from St. Louis; John Durack, Captain," We commenced our downward trip the same day. In the latter days of the Journey we saw on either shores large bands of buffaloes, deer and elk, and succeeded in killing at different times many of all.

A number of cases of cholera occurred on board during the month of May, six of which terminated fatally.

Terrific Storm.

On the evening of Thursday the 18th inst. the city of New York, and all the Southern and Eastern sea coast, was visited with one of the most destructive storms of rain and wind that has taken place in thirty years, at this season of the year. Although the destruction of property was very great, happily the loss of life has been moderate. Houses were blown down in New York, trees torn from their roots, iron posts snapped like windlestraws, andnumberless vessels wrecked along our coast. The scene on Friday morning around pur city and along the Bay, reminded one of "the morning after a battle."

The New Cabinet.

President Fillmore has chosen the following gentleman for his cabinet officers:—

Secretary of State—Daniel Webster, of Mass; Secretary of Treasury—Mr. Corwin, of Ohio; Secretary of Interior—Mr. Pearce, of Maryland; Secretary of War—Mr. Bates, of Missouri; Secretary of Navy—Mr. Graham, of North Carolina; Postmaster General—Mr. Hall, of New York; Attorney General—Mr. Crittenden, of Kentucky, This is considered a strong Whig Cabinet, being composed of three Northern and four Southern men.

The Atlantic Steamship.

This splendid steamship of the Collins Line, arrived at her wharf on Sunday morning last at 2 A. M., making the passage from Liverpool to New York in 10 days and 15 hours. This is the quickest passage that ever has been made to New York from England. The Asia arrived at Halifax on Monday, after a passage of 8 days and 21 hours. The Africa, a new steamship of the Cunard Line, has been launched on the Clyde. She is to be the mate of the Asia.

California.

The Crescent City steamship arrived at New York last Monday, bringing news of two weeks later date from California. She brought $180,000 in gold dust. San Francisco has had another destructive fire; 300 buildings were destroyed, the loss of which has been estimated at $5,000,000.

Sir Robert Peel.

By the late news from England we learn that this great statesman, who has been twice premier of England, is dead. He was killed by a fall from his horse.

Sentence of Prof. Webster.

The Committee of Pardons have sentenced Prof. Webster to be executed on the 30th of August next. The principal argument presented for commutation of his sentence was his previous high standing in society and the respectability of his connections.

A Sam Patch has appeared in England, whose feats surpass those of his illustrious predecessors. This sub-aqueous prodigy leaped into the water from an elevation of eighty feet, with a pair of boots in his hand, which he succeeded in putting on before he came to the surface!

The product of turpentine in Georgia and Florida, for the year ending 1st of September next, is estimated by the Savannah Republican at 30,000 barrels, 25,000 of which is to be credited to Georgia.

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Letter from Mr. Paine.

A peculiar interest in the Scientific American prompts me to notice your article on my light in your paper of the 13th inst., which appears to me to be written without that spirit of candor and impartial truth which has heretofore formed the marked peculiarity of your editorials.

The first part of the article alluded to makes mention of the announnement of the discovery and the exhibiting of the light from the cupalo of the Exchange. As the light *was* so exhibited, I am at a loss to account for the mention of the matter at all, without it was found necessary to use it for the purpose of stating that "we took the opportunity to prove by figures that he was wrong—entirely wrong in his calculations." Assuming that I am right in this conclusion, I will take this opportunity to state that your calculations were based upon the interest of the first cost of the apparatus, while my statement referred particularly to material consumed, as you will perceive by reference to the article in question.

I can find nothing in your second paragraph which demands notice or reply till we come to the sentence—"this was the first check move to Mr. Paine's beautiful light made from water." Now let me ask, what was the "check move?" An anonymous writer attacked me, and used some two or three columns of your paper to prove (what I never denied) that pure hydrogen would not yield a white light. I had never at any time stated that a white light was obtained from hydrogen alone; but, on the contrary, that I decomposed water and used the component gases for purposes of illumination. If the writer alluded to saw fit to assume any point in his article as a basis of argument, I did not see fit to point out his error. Anonymous writers certainly cannot expect from those they abuse the courtesies due to manly signature. My affirmation was that I produced a brilliant white light by the *component* gases obtained from water. "Gior's" reply of three columns was that pure hydrogen would not yield a white light. It really seems to me that the "ambiguity," lays at "Gior's," alias "Carburetted Hydrogen's," door.

As the third paragraph relates to Mr. Porter, I will of course be permitted to pass it by, and notice the fourth, where I find the statement, "that in a number of experiments we have utterly failed to resolve water entirely into a simple element like Mr. Paine." In reply I might content myself by asking you if there are not a great many acts accomplished by others which you would "utterly fail" to do if you should try without knowing how? But as the tone of the sentence implies, that what I can't do, you can't do; I choose to meet the matter by referring you to the statement of nine eminent citizens of this place, which has appeared in various public journals within a few days past, and which, by the way, I do not see in your columns, although you published at full length the statements of a self-constituted Committee, upon the subject of my light.

I believe sir, that it is a favorite axiom with you, that practice is better than theory. Your correspondents theorize that I can't do as I assert. Men of high standing certify that I am doing all that I claim to do, and that they have seen it done; and if you, sir, have not witnessed it yourself, it is because you would not,—for months ago I offered to open a free passage for you, too and from this city if you would come and examine for yourself.

At the commencement of your last paragraph you say, "Well, after all that has been said and done, it comes out at last, driven out by our correspondent, that Mr. Paine uses carburetted hydrogen." In reply to this I would say, that as I have already conclusively shown that "our correspondent," or "Gior," had been fighting men of straw, it is not necessary for me to notice him any further; but I will simply state for the information of your readers, that for months before, and at the period of our correspondent's" driving operations, my dwelling was lighted with a brilliant white light without the process of carburetting, the two gases being burned upon prepared calcium points. The assumption, therefore, that follows, that I have been "driven to the admission, carefully concealed before," is totally unwarranted. At the risk of a further charge of ambiguity, I would remark, that the correct statement with reference to the carburetting process (which is of a recent date) is as follows:—one pint of the turpentine of commerce is the only agent, or material, having cost, required to maintain a brilliant white light with an "argand burner," for one thousand hours; and I would further state that with the light from a common bat's wing burner, perfect daguerreotypes have been taken by an artist (George Adams) of this city, without the aid of reflectors or other concentrating agents.

In concluding your article, you remark, "if Mr. Paine is right, it is very easy for him to prove himself pure in all he has said;"—a very trite and safe conclusion, but as it is a conclusion drawn from a demonstration, the suppositive "if" has no part in the matter. Mr. Paine has proven himself right to all pecuniarily interested, and they are the only parties that have any right to such a proof. The truth is, too much has already been proved for the interest of the owners, if the fears of our English Solicitors, Messrs. Newton & Son, are correct, for they write us "that the explanations already given in the American papers have endangered the English patent."

I do not think, Mr. Editor, that equal and exact justice has been done me in your last journal. I did hope to see in your columns the statements of the Worcester citizens—the statement of men who have watched this discovery from its earliest date, many of whom know the whole rationale; I say, that after after the self-constituted and interested Committee's finding a place in your paper for their suppositions, I did expect some little corner might be found for the facts of the others.

In short, sir, I am inclined to think that your article, like many others, was written to draw me out, if so it was labor in vain. I am determined that there shall be one discovery with one claimant—one inventor that knew his rights and maintained them. I am at issue with the world, and will remain so till it gives me a just and fair equivalent for my property. Yours, HENRY M. PAINE.

[Our answer to Mr. Paine will be brief;—First, he is in error in supposing we mentioned the Light on the Cupalo of the Exchange "to prove by figures that he was wrong." We mentioned it to let Mr. Paine know that the time has now arrived—(more than a year having passed since then)—to let the world know whether his light was *new* or not. Second,—No anonymous writer ever attacked *Mr. Paine* in the Scientific American; his letter reviewed only the statements that had gone abroad respecting it. Not a word personally was said against Mr. Paine—we would not allow that. Third,—Our skepticism is not relieved by Mr. Paine, about resolving water entirely into oxygen and hydrogen. Fourth,—we have seen the statements of the nine eminent citizens of Worcester, but their statements do not throw any light upon the subject. Fifth,—The committee whose Report we published was not self-constituted: they were invited. They are all "honorable men." As it respects the "carburetted hydrogen," we refer to the articles mentioned in our editorial, to which Mr. Paine refers. Daguerreotypes have been taken by Staite's Electric Light—an intense bright light is not necessary to the taking of daguerreotypes; Mr. Paine is in error if he thinks this,—daguerreotypes have been taken by moonlight (lunar photography)—Mr. Roach, of New York, has done this; he has made the moon paint her own portrait in a half-sized camera.

We assure Mr. Paine that we have the greatest respect for the statements of those citizens of Worcester, who have watched the progress of his light; but we have more respect for our own experience—we cannot surrender our opinions, founded on scientific data, for the mere statements of any man or men, however respectable. As scientific journalists. it is our duty to point out what is opposed to scientific experience, in those alledged new discoveries; other papers, that are not able to do so, say aye, aye, or no, no, according as they get their cue; some running up and some running down Mr. Paine. We acknowledge one purpose of *our* article, Mr. Paine, viz., to "draw you out." If we cannot do this, we must say you are an incorrigible man, Mr. Paine, and you may just place us in the same category until you inform us how you produce your light—that alone will cure our skepticism, and we warrant you that you need not fear our infringement, nor that of the public either, if you were to publish it bright in the face of the sun, moon and stars. ED.

For the Scientific American.

Review of the Rise, Progress, and Present Importance of Cotton Manufactures of the U. S., together with Statistics, showing the Comparative and Relative remuneration of English and American Operatives.

BY THOMAS H. DODGE.

There is nothing perhaps, upon which Americans can look with a greater degree of joy and heartfelt satisfaction, and to which they can point the visitor and stranger from other climes and nations with a more just and lofty national pride, than to American manufactures and internal improvements. And although they are as yet, as we hope and trust, but in the first forming nucleus of their future growth and greatness, yet they are even now of sufficient magnitude and importance, whether considered in a moral, political, or commercial point of view, to justify the American citizen in pointing to them as being among the first and legitimate fruits of our free political and religious institutions. And while they strike the representatives of foreign nations with a feeling of awe and admiration, as they trace their majestic and noble growth back to the unpropitious circumstances that attended their birth and feeble origin, they at the same time afford to Americans the most ample, positive and convincing evidence of the varied blessings that have accrued, and are destined still to accrue, from their republican form of government, while they render the cheering assurance to every American citizen that the institutions under which they live are based and grounded upon the firm and immutable foundation of justice and truth, to such a degree and extent that with a just and proper regard, upon the part of American citizens, to the memory of those who were instumental, by their self-sacrificing labors and devotion, in the hands of an overruling Providence in establishing them, blended with an adequate and an abiding sense of the duty and obligation which they owe as American to the countless millions now struggling to be free in the womb of coming time—they will endure, with the blessing of Almighty God, to bless, elevate and ennoble mankind, while present worlds their lengthened courses run. And since it is my object at the present time to speak more particularly of one particular branch of American industry, it would give me great pleasure to dwell at length upon the subject, and go into minute details respecting the many interesting and important features and facts which are so closely woven and interwoven with its history from the time when first it struggled into an uncertain and precarious existence, down to the present time; but the space allotted to the present article will not permit of but a very brief and concise review of the subject. Therefore, in reviewing the very important and interesting subject of "Cotton Manufactures in the United States," I can but give a skeleton sketch, comparatively, of that which to be given in full would suffice to fill many large volumes with important, useful and instructive matter. I shall, however, endeavor so to treat the subject as to furnish all who feel disposed to give it a candid consideration sufficient data from which to form a just and adequate conception of the claims which cotton manufactures have upon the care and attention of legislators and all, but more especially of those who have entrusted to them the control and direction of the affairs of the nation.

To understand and appreciate the advantage and claims of any one particular branch of industry, so as to be able to render to it a just and proper succor and support, we must not only be acquainted with one isolated fact, but with each and every one connected with it; and that too in all the varied and complicated relations and combinations which each sustain to another, and all to each, and each to all. And to no branch of industry will this rule apply with more force and truth than to cotton manufacturing in the United States.

I now invite your attention, Messrs. Editors, and especially the attention of those who have looked in years past and who still look upon manufactures as having received too large a share of attention, or rather protection of government, to a careful consideration of the subject. I will say, however, before proceeding further, it is not my intention to treat the subject as a party question, for I believe it is one that appeals to one party as much as another; and further, that it is one which, when the facts and all the facts respecting it are clearly and properly understood, will receive the cordial support of the whole nation, and will then be placed forever beyond the arena of political and party strife and turmoil, a settled question never more to be contested. For reasons already given I am compelled to cut my remarks short respecting the earliler history of cotton manufactures in the United, by saying that they struggled hard for a footing until after 1789. Samuel Slater, a practical English manufacturer, having come to this country from England, during the year 1789, succeeded in reviving manufactures, and gave them a new impulse by introducing the improved machinery of England. From 1789 to 1815 manufacturers met with obstacles and discouragements of a manifold nature, they struggled on, hoping for better days, although it was often like hoping against hope. From 1815 to 1824 the struggle was less discouraging, yet often dark and dubious, but the successful introduction of the improved spinning jenny and the power loom was a new era in cotton manufactures. From 1824 to 1833 manufactures increased rapidly, and no doubt now remained that American manufactures, with suitable protection from government, would soon out-rival the mother country not only in coarse goods but in the finer fabrics.—

In 1834 we find the amount manufactured to be about 375,700,000 yards per annum; in 1836 about 401,200,000 yards. Thus we see that though many obstacles were in the way of successful progress of manufactures, they still continued to acquire new and additional strength and importance. I shall now proceed to give a more definite account of the increase of cotton manufactures for the spaee of eleven years, from 1838 to 1848 inclusive.

A TABLE showing the number of Spindles run, and the number of yards of Cloth manufactured in the principal cotton manufacturing establishments in the United States per annum, together with the annual increase from 1838 to 1848, inclusive.*

Years	No. of spindles.	No. of yds. manufactured.	Increase of No. of spindles.	Increase of No. of yards.
1838	1,422,000	469,200,000	185,000	51,000,000
1839	1,520,000	501,500,000	98,000	32,300,000
1840	1,530,000	504,900,000	10,000	3,400,000
1841	1,375,000	453,900,000	decrease	decrease
1842	1,674,000	552,500,000	* 97,000	*32,300,000
1843	1,788,000	589,900,000	114,000	37,400,000
1844	2,004,000	661,300,000	216,000	71,400,000
1845	2,174,000	717,400,000	170,000	56,100,000
1846	2,267,000	748,000,000	93,000	30,600,000
1847	2,576,000	850,000,000	309,000	102,000,000
1848	2,800,000	918,000,000	224,000	68,000,000

Total No. of spindles in 11 years, 1,130,000; total No. of yards manufactured, 6,966,600,000; total increase of spindles, 1,516,000; total increase of No. of yards manufactured, 484,500,000.

Average per year—No. of spindles, 21,920,909; No. of yards manufactured, 633,327,272; increase of spindles, 137,818; increase of No. of yards manufactured, 44,045,454.

* Gain after deducting what 1841 lost.

In respect to the above table it may be proper to remark, that the number of spindles run and yards of cloth manufactured each year do not indicate the exact amount of machinery built and set to running upon any particular year.

(To be Continued.)

[These articles have been prepared with great care by Mr. Dodge, and at considerable trouble. They will be completed in two more numbers.—ED.

Prof. Spencer F. Baird, of Dickenson College, Carlisle, Pa., (a distingushed naturalist,) has been elected by the regents of the Smithsonian Institute, at Washington, assistant secretary of that institution.

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New Inventions.

Coating Iron Pipes with Glass.

At a late *Soiree* of the President of the Society of Civil Engineers, London, some specimens of iron manufacture were exhibited, coated with glass, from the Smethwick Iron Works of Messrs. Selby & Johns, near Birmingham, and which would appear to be the very desideratum so long sought for. There were three ornamental dinner plates, three pieces of iron tube, a frying pan, a piece of corrugated iron roof, all covered with a clear, transparent glass, and which were viewed with much admiration by the visiters. In the process of coating plates, corrugated or plain roofing, tiles, tubing of all kinds and dimensions, frying pans, gridirons, saucepans, kettles, cauldrons, or boilers, in lieu of coppers, and a host of other implements, domestic, agricultural and manufacturing; the article is first thoroughly cleansed in an acid solution, to free it from every particle of grease, similar to the preparation for tinning, zincing, &c. It is then covered with a glutinous preparation, over which is laid a coat of glass, ground to a fine powder.

The article is then introduced into a furnace of peculiar construction and sufficient temperature, in which the glass is fused, and the intermediate glutinous matter being evaporated, the glass fills the external pores of the metal and becomes firmly united to it, and, in answer to our inquiries, we were informed that as the manipulation became facilitated by practice, it was probable that the cost of a glass-coated iron material, of these common kinds, would be but a mere nominal trifle more than the plain articles themselves.—[Min.Jour.

The dinner plates shown were four ounces lighter than an earthenware plate of the best construction, size for size. The foliage and designs are in relief, and are executed by a kind of stenciling; one color being put on, it is tranferred to the kiln and fixed; then, when cold, another color is added, again fixed, and withdrawn, and so on until the design is complete. The application of this art to different kinds offurniture is apparent and should arrest the attention of our Yankee friends, many of whom have but to receive a hint, and the thing *is done.*

New Nautical Instrument.

Mr. A. Girard, of Mobile, Ala., has invented a new instrument for taking the altitude of the sun, and to take it at any hour of the day, on sea or land, by its shadow, without a horizon. By adding to the angle given by the instruments, the semi-diameter of the sun and its refraction, we obtain its true altitude, and by adding the declination at noon the true altitude of the place where the instrument stands is arrived at—that is, if the latitude and declination are both north. If, however, one is north and the other south, then the declination must be subtracted. The Mobile Herald says that six of these instruments have been ordered by the pilot of the West India Mail Steamers, and it is the intention of Mr. Girard to forward one of the instruments to the Grand Industrial Exhibition which is to be held in London next year, to contend for one of the prizes that are to be offered there.

New Tobacco Sifter.

Mr. Andrew Conger, of Montgomery, Orange Co., N. Y., has invented a most excellent improvement on machinery for assorting cut tobacco, which must be of great benefit to those engaged in the tobacco manufacture, who have heretofore done the sorting by hand labor. The improvement consists in having a long hollow revolving polygon with teeth in the inside, set upon an incline, and having a bolting screen on its lower end, into which the cut tobacco is conducted at the upper end, then shaken from the sides of the polygon and sorted by the spikes, and then carried down the incline, where the shorts are shaken through the bolting screen, and the long fine sorted tobacco delivered in beautiful order at the end of the machine. This sorting machine is said to perform its work far better than a cylinder sorter.

Life Boats.

Strenuous efforts are making to obtain a law of Congress to compel our steamers to carry metallic life boats. This would cause a great saving of life.

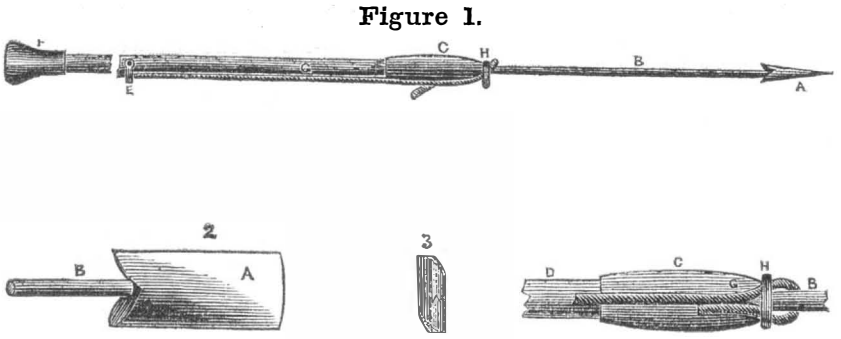
A new invention, in the shape of a safety yatch, has been exhibited in the Serpentine, in Hyde Park, London. The hull is partly composed of gutta percha, and is so constructed, that a shot passing through it, will not sink the boat, with its complement of men. It is the subject of much interest and high eulogium.

Daguerreotype of a Star.

Mr. Bond, of the Cambridge, Mass., University has dagurreotyped the star Lyra. This is believed to be the first instance in which an attempt to Daguerreotype a star has succeeded. The picture of the star, the Boston Traveller says,, is quite distinct, and of the size of a common pin head, and was obtained in about 30 seconds, the great refracting telescope of the Observatory being used without the eye glass. Scientific men will regard this experiment with interest, as the possible prelude to important astronomical developements.

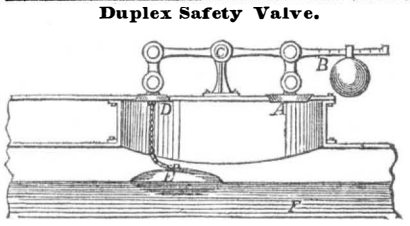
IMPROVED HARPOON.

Figure 1.



This harpoon is the invention of Capt. C. F. Brown, of Warren, Rhode Island, who has brought so many useful inventions before the public, and whose mind is fertile with improvements in machinery and the arts. The improvements in this invention consist of three parts, illustrated by the accompanying engravings, figure 1 being a longitudinal view; fig. 2 a view of the head; fig. 3 an edge view of the head; fig. 4 an enlarged section of socket, ring and rope. The same letters refer to like parts. A is the head, B the metal shaft, C the socket of the shaft; H is a loose ring around the socket; G is the rope, E is a guide, ring, F the handle. To those who are acquainted with harpoons, the difference of this one from those in common use, will be apparent at a glance. The head is of a chisel form at the point, and its edges run up to its barbs in a winding direction, so that the barbs are out of line with the cutting face, thus making it the section of a screw. The object of this is to prevent the harpoon from being drawn out by the barbs, after they sink into the whale, holding firm against an uncut part. There are no cutting sides to this head, to cut sideways and make a large opening by lateral motion of the instrument, to allow the harpoon to be drawn out easily, as often happens with those now in use. By having the socket, C, so formed as not to let the ring, H, run down the handle, but tapering to the shank, B, any kind of rope may, without a spliced loop, be applied in a minute, simply by running it through the ring, round the shank, and back through the ring again, as represented in figure 4. The rope in this case will draw the ring upon the socket, C, and bind it as firmly as if it were spliced and looped. There are three improved points, viz., the spiral form of the head, the blunt sides of the head, and the loose ring and tapering socket. The Captain has taken measures to secure a patent, and as he has struck down many monsters of the deep, knows the defects of the whaling instruments in use, and has a surprising turn for mechanics; it is justly to be expected that this is a valuable invention and one demanded to advance the art of whale fishing—a very important and lucrative branch of American enterprise, and one in which we have long been distinguished above all other nations—our success, no doubt, being attributable both to the enterprise and ingenuity of our Eastern mariners.

Duplex Safety Valve.



This valve is the invention of Mr. S. A. Williams, of Cornwall, Wales, its object is to prevent the ordinary valve from adhering to its seat, when, from any cause, the internal pressure falls below the atmospheric pressure, and also to indicate the quantity of water in the boiler, to prevent it from getting too low. This engraving is a section of the manhole of the boiler. A is the common safety valve; it opens in the usual way, and is linked to the weighted lever, B. C is the fulcrum on the top of the fixed pedestal. The weighted lever, B, is extended to the other side, beyond the fulcrum, to a distance equal to that of its distance from the valve, A. D is a small valve linked to this opposite end of the lever. It is placed inside of the manhole lid, opening downwards. Any upward movement of the valve, A, produces a corresponding downward movement of the valve, D. The internal pressure tending to open the valves, will be exerted only on the excess of the area of the larger valve over the area of the smaller one. This excess should be the whole area of D. A chain is connected to a float, E, and the small valve. When the float is kept up by the water, F, the chain is loose, but when the water falls below the proper limit, the valve, D, is drawn down, and the valve, A, up, thus blowing off at once a great deal of steam. This valve is somewhat interesting as being a very neat modification of the equilibrium valve.

A New Rotary Steam Engine.

The editor of the St. Louis Republican has been visiting a new rotary engine invented by Mr. James A. Stewart, of that city. It is in operation in a saw mill: he speaks of it as follows:—

"It is small and compact, not occupying more than three feet square, has no complicated machinery about it. The steam being communicated directly from the boiler, without any reciprocating valves to the chest in which its expansive force is exerted on the cog-wheels that produce the motion. In our formnr article we gave such a notice of its construction as we could, and will not attempt here to repeat it. At that time we doubted whether the journals would remain steam-tight, there being no packing used, and water or condensed steam supplying the place of oil. A continuous use of it for several days leaves no room for doubt on this. We witnessed the sawing of some heavy timbers and its work was all that could have been desired from any engine. The boiler was not carrying more than about fifty pounds of steam, when the fires were stopped, the doors thrown open and the flue heads taken off, and yet with the diminishing steam, it continued to work well until the steam was down to not exceeding seven pounds.

That it is admirably adapted to the propelling of mills and manufactories, and that it is less liable to get out of repair, can be run at less expense and risk than the ordinary engine, seems to be conclusively shown in the instance alluded to. We understand that arrangements have been made for their manufacture on a large scale, in this city."

[It has been our fortune to see no less than ten different kinds of rotary steam engines in operation in the course of three years. Some of them worked well for a while, but there is not a solitary one of them in operation now. Some of the inventors entertained high hopes of their superiority over all others.

Hard Black-Lead Pencils for Artists.

The pure Cumberland black-lead (plumbago) is of too soft and yielding a nature to enable an artist to make a fine clear line; to produce, therefore, a pencil that will effect this, a hard resinous matter is intimately combined with the lead in the following way:—Fine Cumberland lead (in powder) and shellac are first melted together by a gentle heat; this compound is then reduced to powder again, then re-melted, then powdered again, and re-melted until both substances are perfectly incorporated, and it has acquired a perfectly uniform consistence. The mass is then sawed into slips, and glued into the cedar mountings, in the usual manner of making other black-lead pencils. To render them of various degrees of hardness, the materials are differently proportioned; the hardest having the most shellac, the softer but very little, and the softest none; and their blackness is increased in proportion to their softness.

Imitation of Gold.

M. Deittmer has published in the Hanoverian Magazine, the following description of a compound metal, invented by Professor Hermstadt:—Take of pure platina 16 parts, copper 7, and zinc 1; put them in a crucible, and cover them with powdered charcoal, and keep over the fire until they are entirely melted into one mass. This compound is stated to be not only the same colour as gold, but likewise equal to it in density (sp. gr.) and also in ductility.

Imitation of Platina.

Melt together one pound of brass with ten ounces of zinc; but as brass is composed of copper and zinc in the proportion of about three pounds of the former to one pound of the latter, equal parts of copper and zinc will produce the same compound in imitation of platina.

These receipts are worth more than the subscription price of our paper, to some of our readers.

New Soft Metalic Packing for Stuffing Boxes.

Mr. W. H. Shock, Assistant Engineer, U. S. N., Philadelphia, has invented an improvement in soft metal packing, which appears to be a good improvement and for which he has taken measures to secure a patent. It is designed for the stuffing box of a steam cylinder, around the piston rod, and consists of sectional conical cups of soft metal fitted into corresponding cups in brass or iron rings, acted on by the piston rod and a helical spring, so as to be elastic, and from the peculiar shape of the soft metal packing and the action of the spring, the packing is always kept close up or binding on the piston rod, however much it may be out of line.

New Mode of Preserving Pork.

We have received a beautiful piece of pork from Mr. Wm. Taylor, of Schenectady, N. Y., as a sample of a new discovery made by him for preserving meats. We believe his process for doing this must be a good one, for the piece to which we allude has been kept for two years, it scarcely tastes of salt, is firm and, (to use a Yankee phrase,) "is as sweet as a nut."

New Reaping Machine.

Mr. Smauel H. Little, of Hagerstown, M. D., has invented a machine to cut grain. It was tried the other day on the farm of Mr. Hamilton, and with one horse cut from five to six acres a day.

The Wheeling Bridge.

PHILADELPHIA, July 18, 1850.

GENTLEMEN—By your paper of the 20th, it is stated that Chancellor Wallworth has reported that the Wheeling Bridge is a nuisance. Permit me to correct this statement: Chancellor Wallworth has not yet heard all of the evidence nor the arguments, and of course has made no report on the subject. Yours, &c.,

WM. W. HUBBELL,

Of the Counsel for the Bridge Co.

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Scientific American

NEW YORK, JULY 27, 1850.

A National Steam Marine.

However great, glorious and necessary, large standing armies and huge fleets are, to maintain the power of despots and aristocratic governments, they are neither necessary to the maintainance of the institutions of our Republic, nor are they required to make the name of America,

"Revered at home, beloved and feared abroad."

These sentiments forced themselves upon our mind as we read an article in the National Intelligencer, signed "Pennsylvania," laying down a plan for a great national steam marine. The plan is to create a stock of fifteen million of dollars (borrowed) at five per cent. interest, payable in twenty years. With this, fifty war steamers are to be constructed, from 700 tons burden, upwards. to 2,500 tons. All these are to be constructed by the Government at Washington, and the small ones instantly to be commenced. It says—

"A sufficient number of the smaller class of vessels shall be launched, to be used as despatch vessels, packets, &c. So that our officers, engineers, seamen, landsmen or "marine soldiers," can be trained to such service.

That the large class of vessels, as far as possible, shall be finished and kept on the stocks.

The maintenance of all the smaller class of vessels would not take many more seamen than one ship of the line or two frigates in time of peace, perhaps. So that if economy is regarded, as these vessels could supply the place of one or two of such other vessels now in the service, no additional appropriation would be needed in employing them of any extent. A coal depot might advantageously be established at Washington, to supply all the steamers, as far as possible, with coal at first cost; thereby saving thousands of dollars and having a sufficient number of steamers at all times (excepting one or two months in the severity of winter) at the seat of government, ready at a moment's notice to start on any service."

It then goes on to prove the necessity of this by quoting what Britain has done for a steam marine. It is all just and right that we should have a steam marine suitable to the wants of the Republic, but we do not believe in the plan of raising one, like gardeners forcing fruits in hot-houses. The best way to establish a Republican steam marine, is the plan adopted towards the Collins Line of Republican Mail Steamers. A mercantile steam marine which can, by previous engagement, be drafted into war service when the exigency of the case demands it, establishes no tax for their support, and offers no inducement for an exhibition of fighting propensities, which are always wonderfully developed in those nations who maintain extensive war establishments. Great Britain is now wisely pursuing this system, and it is more democratic to take lessons from her industrial management, than her national war establishment.

With an increase of our mercantile marine navy, we increase our national resources, but it is not so with our war navy. At present we have four steam ships running to Europe, and we will soon have six. We will only have four to Liverpool when the line is completed—we should increase them to ten, for there can be no doubt but that number could be maintained without any tax to the Government. We should also have a strong Pacific Line, and from what the present line has done with three or four vessels, there can be no doubt but a fleet of ten steamers from New York to Chagres, and as many from Panama to San Francisco, could be supported, and pay well. These two lines would form a fleet of thirty steamships of the first class, with officers all trained in active sea life, and well fitted for the most desperate service. Our steam communication with the Gulf of Florida, such as New Orleans, Cuba, Mexico, Brazil, and away in the Pacific, demands the earnest attention of our government and New York merchants. No sooner had our Pacific Line of steamers commenced operations than they began to wrest the trade from the British West India Mail Line. That government became alarmed for her lucrative trade to the West Indies, &c. and being prompt to maintain her own, she has entered upon a most gigantic scheme with the West India Mail Company, whereby one of the finest steam fleets in the world will shortly be running from Southampton to the West Indies and Brazil every two weeks. The present fleet of the West India Company consists of thirteen ships, ten of which are 1800 tons; five others, of the first class, from 2000 to 3000 tons burden, and engines of 800 horse power are to be added, together with a number of smaller ones. On the whole, this fleet will be a splendid one, of no less than twenty-five steam ships, and it is contemplated at some future day to increase them, and have a line running to the Cape of Good Hope. (The Oriental Steam Company in England is now building ten large iron steamers, and new lines are continually going into operation. These are the kind of steam ships we must encourage.) This great undertaking is to be a huge steam bridge thrown across the ocean from Southampton to Panama, and it well becomes us to have a share in the tolls. This we never could have by a War Steam Navy, but we can by adopting a national and mercantile policy, like that of Uncle John Bull, who in this respect shows himself to be neither gouty phlegmatic nor asleep, but enterprising, liberal and far-sighted. We would add gradually to our steam navy, say two frigates of the second and one of the first class every year This plan would make every wheel in the government and nation mesh sweetly into its appropriate fellow, and enable the whole machinery of it to revolve smoothly, with an abundance of lubricating material to prevent friction and *overheating* of the various parts.

Important, Curious and Scientific Information about Water, Steam, Ice and Explosions.

It was ascertained as far back as 1843, that the greatest rise of vapor resulted from water thrown upon iron at a temperature of 450° or 500°. Evaporation is inverse to an increase of temperature in iron above 500°, and it almost ceases when the iron reaches 1000°. This is in consequence of the slender radiation of the heat of the iron into the water through the spheres of water which form upon the iron when it is raised to such a temperature.—Whatever may be said about the decomposition of water in boilers by red hot flues, whereby the oxygen combines with the iron and the hydrogen is set free, to form an explosive gas, (as is commonly supposed) one thing is certain, that such ideas are erroneous. Hydrogen itself is not explosive, consequently it cannot be the direct cause of explosions. An explosion will only take place when the two gases, oxygen and hydrogen, are mixed in proportions of bulk 2H+O. Now the enquiry to be made is, "can there be an explosion from the decomposition of water by heat." If any person tries to decompose water by heat, he will find it no very easy matter, at least in a common steam boiler. But if the water be decomposed in a steam boiler, still there is not an explosive mixture in the boiler, for the oxygen is not free, but combines with the iron. It would be wrong, however, to assert that decomposition does not often take place in boilers, for there is abundant evidence on record to prove that it does. The question then arises, "since hydrogen is not explosive, and the hydrogen only is set free in the boiler, can it ever become explosive, or what does it want to become explosive?" Sir Humphrey Davy states that a mixture of oxygen and hydrogen gases will explode by the electric spark, even when mixed with five times their volume of steam, but where is the electric spark to come from in a boiler, and without it, or the boiler being heated to the inflaming point, these gases will not explode.

The questions may be asked, "what is pure water, is there any *pure* water in a boiler, is there not a considerable quantity of atmospheric air in all water, and will a mixture of it and free hydrogen in a boiler not form an explosive mixture?" It is true that there is a great deal of atmospheric air in water, which is expelled by the boiling, and this mixing with free hydrogen forms an explosive mixture ready to shatter every thing to atoms when ignited, either by an electric spark or a red hot flue. But as seemingly very different from this, or owing to some other curious condition of the elements of water, it has been found that pure water is explosive when at 300° Fah. Water is only found pure in a state of clear ice; all impurity is expelled from it in the act of freezing; even in sea water ice, there is no trace of salt. An easy way to get soft water in the midst of winter, is to melt ice. It expels every impurity in the act of freezing, and even all the air escapes. How this is done on such a grand scale on our lakes and rivers, under what peculiar condition is not known, but the ice is of great purity, not like common ice, which is often found full of air cells. If water, however, is frozen by being placed in a freezing mixture all the air will be expelled, if the water is kept agitated during the act of freezing. Prof. Farady was the first who discovered that pure ice contained no air, and after that Prof. Donnet, of Brussels, discovered that water free from air, did not boil until its temperature was raised to 300°, and then it burst out all at once. If pure ice, free from air, is placed in a small flask of oil, and set over a spirit lamp, it will explode when heated to 300°. These are but recent discoveries and may it not be, that under a great pressure in a steam boiler, the whole air is expelled, the water heated to 300°, and the result an explosion? May this not account, scientifically, for a great number of inexplicable explosions of boilers?

Powers of the Patent Office.

The whole responsibility of good or bad conduct in the Patent Office is thrown upon the Commissioner. No subordinate, in the eye of the law, is held responsible for any act. If a wrong decision is made, the Commissioner must bear the odium: the public have nothing to do with any other person. In respect to the granting and refusing of patents to applicants, the law requires "*that any person or persons having discovered or invented any new or useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art*, machine, manufacture or composition of matter, not known or used by others before his or their discovery or invention thereof, and not in use or for sale with consent of the inventor for two years prior to the discovery thereof," upon expressing a desire for a patent to the Commissioner, upon due proceedings had, shall receive a patent for the same. The Commissioner has the power to reject, if he does not deem the invention sufficiently useful. Now the great question on this point is,—what is sufficiently novel and useful to form the subject of a patent? It is plain that the Patent Office is somewhat foggy on this point, as numerous wrong decisions have been again and again brought before the public as proof, and especially those mentioned in an Editorial of the Scientific American, No. 40. One receives a patent for what is apparently old and useless, and another is rejected for what is apparently new and useful. This shows favoritism. It is a common opinion, and I have been impressed with its legality by the decisions of the Patent Office in many cases, (not in all, however,) that the new application of anything to a new purpose, to form a new manufacture or improvement, is not the subject of a patent. In looking over the proceedings of the Queen's Bench, before Lord Campbell, on the 21st June, ult., I perceive that the mere application of an old thing to a new purpose, is held to be the valid subject of an English Patent; consequently, as their law is the Common Law, it is a rule for us. The case was Betts vs. Walker and others. The action was to recover damages for the infringement of a patent granted to the plaintiff and one Stocker, for improvements on bottles, jars, pots and other vessels. The patent had a number of claims, but the alledged infringement was in making bottles with internal ledges or bearing shoulders for stoppering. The witnesses for the plaintiff admitted that butter pots and mustard pots were made the same way before his patent was granted. The defendants' counsel said, that as such a ledge was not new the patent was void. The plaintiff's counsel said they claimed the application of the ledge to bottles only, and unless it were proved that *bottles* had been made with such ledges before, the claim was good. Lord Campbell decided that the claim in the specification extended both to bottles, jars, pots and other vessels, and the claim of the plaintiff could not be sustained. The claim was, "We claim the manufacture herein described, of the tops or necks of bottles, jars, pots and similar vessels." Had the claim covered bottles only, it would have been sustained, but it was coupled along with other vessels, to which the ledges had been applied before. Inventors should therefore be careful in making out their claims. From what I see of them in the Scentific American every week, many of them do not appear to be definite enough. This may be owing to a disposition for law tinkering in the Patent Office.

JUNIUS REDIVIVUS.

Light--Lamps and Candles.

It is not every one that knows the difference between a lamp and a candle, how tallow, oil, camphene and gas, are all used to produce the same effect, viz., "artificial light." A candle is made of solid fuel, which before it is burned is melted by the heat of the wick, which forms a syphon to conduct the melted tallow from the natural small cup, formed by the radiated heat of the flame on the wick, and the cooling influence of the atmosphere, which keeps the edge hard, and enables it to retain the melted tallow. The larger the wick of a candle or lamp, the poorer will be the flame, as it cannot be so well supplied with oxygen from the atmosphere. Oil and tallow are mostly composed of carbon, and these require a plentiful supply of air to produce perfect combustion, or the light will not be good. When a lamp is smoky, it does not receive enough of air to produce perfect combustion of the carbon. The Argand burner, which allows a central current of air to the flame, by having a circular wick, produces a brighter flame, but the glass chimney wonderfully improves the light by causing a current to impinge on the outside of the wick. The supply of air to lamps and candles may be too great as well as too little. It is by the combustion of the solid particles (very minute) of the carbon, that good light is produced. By introducing a blast of air along with a jet of coal gas, the illuminating power of the gas is destroyed, but a very great heat without any smoke is obtained. This is an excellent plan for annealing and soldering silver and other fine metals. By supplying a common candle or lamp with pure oxygen gas, instead of air, a much brighter light is produced. The Drummond light is merely the incandesance of lime in a jet of oxygen and hydrogen gases. Some want to make something new out of this, by naming the lime *calcium* (the name of its base.) The flame of a lamp or candle is transparent, as can be proved by holding it up between a bright sunlight, when objects will be seen through it. This proves that a bright light deadens the impression of other objects for the light of a lamp does not appear transparent until it is in the presence of a brighter light than itself. This is evidence that a large room will be better lighted up with a number of small lights than one concentrated bright light.

"*Brains*—Not so necessary for some editors as long ears."

This we copy from a cotemporary journal, and we believe the editor penned it in the fullness of his heart, and under a deep impression of its truthfulness as applied to his own case, for on looking over his editorial *column* we saw an article taken from our pages,—the brainless editor having stolen our offspring and was exhibiting him to the public as his own.

Treatment of the Disease of President Taylor.

We see some of the papers making severe attacks upon the manner the late President was treated by his physicians. This is shameful, especially in those who neither can tell, how nor why he was treated.

The Boydton and Petersburg, Va., Plank Road stock is nearly all taken up,—the distance being 80 miles.

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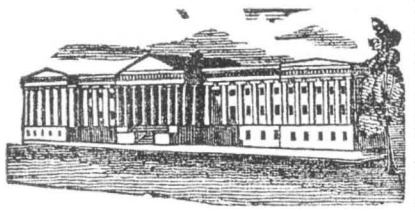

☞ Our weekly List of Patents and Designs contains every new Patent, Re-issue and Design emanating from the Department, and is prepared officially, expressly for the Scientific American, and for no other paper in the city, consequently other journals are obliged to wait the issue of the "Sci. Am." in order to profit by the expense to which we are subject, and of course must be one week behind. Those publishers who copy from this department in our columns, will, in justice to us, give proper credit for the same.

LIST OF PATENT CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending July 16, 1850.

To T. Alteneder, of Philadelphia, Pa., for improvement in joints for Compasses for measuring.

I claim a compass joint formed of two surfaces held together by centre screws, passing through a cap piece, substantially as herein described.

To Z. Allen, of Providence, R. I., for improved machinery for double-folding wide cloth.

I claim the use and application of the rigid prong or extension piece, to act upon the middle of the piece of cloth in the double folding of the cloth, as above described.

To W. W. W. H. T. Bramble, of Lafayette, Ind., for improvement in self-weighing machines for grain, &c.

I claim the combination of a steel yard, with a weighing box, having several compartments which receive the grain alternately, and when a certain quantity has been received the full compartment is discharged, being disengaged by the depressed position of the steel yard; and at the same time another compartment is presented for filling; the apparatus being operated by the weight of the grain itself so as to form an automatic weighing machine by which, with aid of a register or index, amount weighed is ascertained, substantially as set forth.

To J. L. Cathcart, of Washington, D. C., for improvement in Horse-powers.

I claim the eccentric pivot which by turning round allows the entire wheel to be withdrawn from the pinion and when raised by the lever, the wheel can be tilted up for the purpose of taking the horses in or out, substantially as set forth.

To M. L. Chase, of Frankfort, Me., (Assignor to Wm. L. Chase, of Boston, Mass.,) for improvement in Hill-side Plows.

I claim the combination of the adjustments of the hooked bar, with those of the main brace whereby the pitch of the mould-board may not only be increased or diminished, but the proper support of the upper part of the plow-share, be maintained under any angle of pitch, all as specified. The same also admits of a change of the mould-board, viz., the substitution of one larger or smaller.

I also claim the above described peculiar construction of the sward cutter with its groove, to receive the sharp edge of the land side, in combination with the notch in the land side of the share for receiving its lower end, and the notch or shoulder in the upper part of the sheath for receiving its upper end, substantially as specified.

To F. P. Dimpfel, of Philadelphia, Pa., for improvements in Steam Boilers.

I claim, first, arranging a series of bent water tubes within the flue space of a boiler, and connected at each end with the body of water in the boiler, substantially as herein described, by means of which the circulation of water is greatly increased, and the injurious effects due to expansion and contraction avoided, substantially as described.

Second, I also claim surrounding the crown sheet to which the ends of circulating tubes or their equivalents are attached with a rim, substantially as and for the purpose specified.

Third, I also claim extending the ends of the tubes, or the equivalents thereof, above the crown plate or roof of the fire-box, or any other plate or plates, one side of which is fire surface, to which they are attached, when the other or lower end communicates with a centre space or spaces below or beyond the plate to which the upper ends are attached, substantially as, and for the purpose specified.

I am aware that a patent was granted to Richard Prosser, in England, in February, 1830. See Newton Journal, Vol. 15, conjoined series, page 271, in which are represented circulating tubes with one end projecting above a plate. I do not claim such an arrangement, believing that described by me to be substantially different, and producing an entirely different effect.

Fourth, I claim giving a forced circulation to the water through the boiler or generator by mechanical means, substantially as, and for the purpose specified.

To G. Fisher, of Raleigh, N. C., for improvement in Spring Saddles.

I claim the springs placed between the movable seat and the body of the saddle, in such a manner as to be easily taken out and changed, as described.—[See Eng. in No. 35.]

To M. Hardaway, of Troy, N. Y., for improvements in Spike Machines.

I claim the method of imparting to the header a compound motion for first bending the end of the spike downward, and then move it forward against the die to form the hook end simultaneously with the operation of rolling the opposite end to the form of a wedge, with a roller of the same width of periphery, as the thickness of the spike, the said header being fixed to the end of a turning shaft passed through the lever and inserted into a segmental cogged or toothed plate, made to match into a fixed segment rack, by which the angle of the header is changed to correspond with the required form of the head of the spike, as the lever is vibrated by the motion of the cam shaft and the roller, being moved in the arc of a circle as it rotates on its own axis, by being attached to the short arm of the *bent* lever, whose long arm is attached to a wrist of the wheel or plate on the cam shaft, as herein fully set forth.

To J. Hollen, of White Township, Pa., for improvements in Knitting machines.

I claim, first, the projecting and withdrawing the needles separately and singly, with their arrangement, as described, by which I am enabled to knit closer work with stouter needles, substantially as described; and secondly, in combination therewith, I claim the combination of the jack, the sinkers and depressers, substantially as described.

Thirdly, I claim the thread-bearer, having an extended sideway motion to and fro, at each stitch, by which it lays the thread across the needle at each stitch, and returns with it to be ready for the next stitch.

Fourthly, I claim the spring vice for regulating the supply of thread to the needle opened by the rod, as described.

Fifthly, I claim the particular arrangement and combination of the several parts of the machine, by which their various motions are derived from a single crank and screw thread, as described.

To John Locke, of Cincinnati, Ohio, for improvement in Surveyors' Compasses.

I claim the application of the partial lens or lens of reduced size, by means of which to view a cross-wire or a sight mark in optical contact with the object aimed at, either in the compass, in gunnery or for any other purpose requiring and using a sight in the manner herein described, or any other substantially the same, and which will produce the intended effect, especially do I claim also the arrangement by which my compass sight is made susceptible of having either end used as the eye-piece, and by which back and forward sights can be taken without disturbing the instrument.

I also claim the convenient model of the compass to be used with the sight here described, viz., with a super imposed plate, and with the sight planted and supported upon it, and with the opposite readings at such places as are required in order to obtain indirectly the reading of the occasionally concealed end of the needle.

To Wm. Mallerd, of Providence, R. I., for improvement in sizing compounds for warps or yarns.

I claim the combination of the same and the composition of animal tallow, oil, and caoutchouc, in or about in the propositions specified and for the purpose described.

I also claim the combination of alcohol, with the composition of resinous alkaline and other matters as specified, and for the purpose as above stated.

[If the alcohol is to preserve the size, the thing is not new.—Ed.]

To C. Poppenhusen, of New York, N. Y., for improvement in machines for cutting veneers.

I claim the application to machines for cutting veneers and thin boards, of a spring carriage, or gate, with knife and spring, substantially as herein described.

To G. Rohr, of Charlestown, Va., for improvement in the seeding apparatus of seed planters.

I claim, first, the combination and arrangement of the segmental plates or valves secured together by circular rings and heads, and arranged over the circumference of the cylinder, adjacent to the openings therein with the rotating cylinder, constructed as described, for the purpose of partially or entirely closing the openings in the cylinder through which the seed passes to the depositing tubes, and thus regulate or check the discharge of the seed, as described.

Second, the arrangement and combination of the elliptical spring, rising and falling beam and hand lever, with the depositing tubes and drill teeth; by which all the depositing tubes and drill teeth may be raised and lowered simultaneously as described, without stopping the planting.

Third, The arrangement of segmental shields or covers on either side of the upper portion of the rotating cylinder, in combination with the intermediate semi-circular spout or gutters beneath the cylinder by which any waste of the seed is prevented during the rotation of the cylinder or its discharge from the openings before passing the segmental shields or covers, as described.

To D. Stiles, Jr., of Middleton, Mass., for improvement in feeding apparatus for Straw Cutters.

I claim attaching the feed hand to the reciprocating knife gate below the bottom of the feed trough, when said bottom is made with an opening next the knife, in which the feed hand operates, and through which all extraneous and hard substances descend before reaching the knife, so that whilst the said feed hand acts on the hay or straw, or whatever is to be cut, at its most compact part, it at the same time offers no obstruction to the insertion of the straw as it stands, entirely out of the way, and leaves the top open and free, the opening in the bottom of the trough serving to rid the hay, or straw, or corn stalks or sticks, stones and other objectionable substances which would tend to injure the knives.

To. S. Truscott, of Columbia, Pa., for improved apparatus for regulating the contraction of Car Wheels.

I claim the combination of the apparatus for directing the cooling fluid centripetally against the outside surface of the hub when constructed in the manner herein set forth, with the apparatus for letting the sand descend from around the hub and retaining it over and about the arms and rim as described.

I likewise claim the combination of the bed plate, made with the curved conductor and slide to confine and discharge the sand with the circular iron ring, which forms and chills the tread of the wheel.

DESIGNS.

To A. Richmond (Assignor to A. C. Barstow & Co.) of Providence, R. I., for design for stoves.

Woodworth Planing Machine.

Judge Irwin, as we learn by the Pittsburg Commercial Journal, has delivered his opinion in the case of Elisha Bloomer vs. William Dilworth, for alledged infringement of the Woodworth Patent. The bill was filed on the first of July, 1850, by the plaintiff praying for an injunction. The defendant denied, 1st, that Woodworth was the true inventor of the machine patented by him in 1828. 2nd, The reissue of the patent in 1845 was not for the same invention as the patent of 1828. There were some other points of defence, but they related to the terms of bargain, and are of no interest as a general rule. The judge gave his opinion adverse to all the points of defence, and ordered an injunction, but directed the plaintiff to give bonds in the sum of $5,000 in case he could not sustain his suit in a trial by law, in a court to *recover damages* for the infringement.

In reference to the Woodworth Patent, the United States Supreme Court has decided in one case that the renewing of the *knives* or planers, in a *machine* (owned by an assignee before the re-issue of the patent) "was necessary repairs," for which the defendants were not amenable to the Woodworth assignees, they being allowed by law to use the specified machine after the re-issue, which they owned before it was re-issued. We have always reckoned this to be a singular decision and not a correct one, because in every case this makes the Supreme Court the minor judge of what particulars repairs in every such machine "are necessary repairs." A new roller would be a necessary repair, and so with every other part. Everybody knows the case of the student, the professor and the jack knife. Such a decision is just such a case.

Patent Cases.

In the U. S. Circuit Court, for the Northern District of New York, July Term, 1850: before Judge Conklin. Peter A. Burden vs. Erastus Corning and J. F. Winslow.—This was a trial for an alledged infringement of a patent granted to Henry Burden, the inventor. There were three grounds of defence:—1st. That the patent was void for multiplicity of claims. 2nd. Void for want of novelty. 3rd. The defendants had not infringed. The defence introduced an old patent for making bullents by pressure, granted in 1813 to Thos. Bruff, and introduced machines for milling the edges of buttons, used in Waterbury, Conn., and also machines for milling the edges of coin used in the mint at Philadelphia, in 1833. On all the three points the judge charged in favor of plaintiff; Burden's patent was for converting puddlers' balls into blooms continuous pressure and rotation between converging surfaces, thus dispensing with the hammer, roller, alligator's jaws, &c., which were previously used for the same purpose. How machines for making bullets, or buttons or coins, producing entirely different results, could be held up by good counsel to make this patent void, is puzzling to us, and no doubt was so to the judge, who ruled otherwise. The *main* point charged by the judge was—

"That the machine used by the defendants is an infringement of the plantiff's patent if it converts puddler's balls into blooms by the continuous pressure and rotation of the balls between converging surfaces, although its mechanical construction and action may be different from the machine used by the plaintiff; and under these instructions the jury without retiring rendered a verdict for the plaintiff of $100. (Which amount was previously agreed on by the counsel for the respective parties, the plaintiff having been the owner of the patent but a few days when the suit was brought.)

The defendants' counsel excepted to the charge of the learned Judge.

H. B. Stanton and Samuel Stevens, Esqrs., of counsel for plaintiff.

D. L. Seymour, Samuel Blatchford, C. M. Keller, A. Worden, and J. A Spencer, Esqrs., of counsel for defendants.

Ballooning in Portugal.

A short time since a French lady, who had ascended in a balloon from Lisbon, was about to descend at a village near the Tagus, but the villagers, mistaking her for a witch, crossed themselves, and loudly proclaimed their defiance of the devil and all his works; some ran away; others fell on their kness and roared for mercy; while a few prepared their weapons for an assult. The poor lady threw out ballast and re-ascended, and with much difficulty landed, unaided, in safety at another spot.

To Purify Sea Water.

For every gallon of sea water use about two drachms of the oxalate of potash and two ounces of ammonia phosphate of soda. This precipitates the salts held in solution in the sea water. The oxalate of soda may also be used. This will purify water to prevent incrustations in boilers.

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TO CORRESPONDENTS.

"J. H. C., of Pa."—We do not know of any position at present to which we could recommend you. Salaries for such help vary from $300 to $1000 a year, but applicants are more numerous than the vacancies.

"W. C. W., of Me."—Your invention is the subject matter of a Patent, and we should think it worthy. You are requested to forward a complete specimen to this office, in order that we may advise with you more fully; the description does not answer our purpose.

"O. H. P. W., of Ala."—We regret that we were entirely unable to negociate your order here, as early as you wanted, and rejoice that you are not disappointed at the result. We had no prospectus on hand, and were obliged to send specimen numbers. We thank you for your interest in extending the circulation of the Sci. Am.

"R. S. H., of N. Y."—A great many patents have been obtained on the article of plows; but notwithstanding, if we rightly understand your description, we think you have invented something which has not been before known or used. If you will send a model, however, we can decide better upon the patentability of your invention.

"F. C. G., of Vt."—Now is an excellent time for you to have your machine published in the "Scientific American," and we should recommend you to have it done at once. We shall publish, in addition to our regular edition of 14,000 copies per week, two or three thousand extra, each number, until the close of the present volume. Send your letters, patent fees, with $10, and we will get up an engraving for you that will do your invention good.

"H. B., of Conn."—We have written to the department in regard to your business, and will communicate the result as soon as we hear.

"L. B., of N. H."—The model of your sash fastener has been examined. We are doubtful about your being able to obtain a patent for it. The eccentric fastener is well known for the purpose, and no claim could be based upon it. Our advice would be that you proceed no further in the matter.

"F. R. S., of La."—We have never heard of a cannon used and loaded upon the plan described. We believe it to be good and patentable. The government, unless you have *friends* at *Court*, will be slow to reward. The hollow shells, to explode when they strike, are not new, we have seen the thing done 7 years ago.

"G. C. G, of O."—Your model and the papers furnished us were forwarded to W. F. Hunter, M. C., with $30, according to your request.

"J. W. R., of Ohio."—We believe your instrument to be new, useful and patentable.

"S. R., of Vt."—We believe your invention to be good. We shall see you when you come along and will then be able to know more correctly about it, to do justice to its merits.

"L. A., of Tenn."—The right of the rock drilling machine of Messrs. Foster & Bailey, is about to be offered for sale. Any communication addressed to us upon the subject will meet prompt attention.

"J. N., of Va."—You made a mistake in the price of the books, the price of the one upon daguerreotyping is $2, and the "Painter" is $1. We shall send them.

"H. Z. McA., of Md."—The same idea has been suggested to us before. No patent could be obtained for it.

"A. S., of Mass."—The decision of the Commissioner in your case was no doubt correct. The principle is the same as Whitelaw & Stirratts', the notice of which probably you refer to. We could not advise you to try again.

"O A. J., of Vt."—We will send a number of Ranlett, as you direct.

"J. M., of Ohio."—In the first place, slides have been used in wheels, and could not in our opinion be patented. Horizontal wheels are now in use, which admit the water in a straight line, but they discharge it whether in motion or not. This point in yours is new.—Turbine wheels are now in use giving 70 per cent.

"B. D. S., of Va."—We shall write you before long in regard to the Canada patent. The arrangements are progressing.

"H. J., of Ind."—Please to inform us without delay, how we shall forward the engraving and Letters Patent, they cannot be sent by mail.

"W. C. L., of N. Y."—We have paid no attention to the subject in question, as it is somewhat out of our line.

Money received on account of Patent Office business, since July 19th, 1850:—

C. F. B., of Conn., $20; J. H., of Mobile, $49,50; G. C., of N. Y., $30; R. & P., of Ct., $27; M. A. & R. N. Y., $30, and R. D. P., of N. H., $20.

About Pumps.

Within the past two weeks we have examined at least six different modifications of the force and lifting pump, none of which possessed any new or patentable features. It is a mistaken idea which many inventors entertain that a change of form constitutes the subject matter of a patent, and hence it is that so many applicants seek advice only to meet disappointment. Inventors should carefully study this subject, as it is one of no inconsiderable importance, before expending their genius upon what can only result to their mortification. We throw out this idea without further comment, but urge its importance upon all who may chance to see it.

American and English Steamships.

Some of our own and the English papers are exhibiting their wisdom by comparing the voyages of the Asia and the Atlantic. The English papers say the Asia beat the Atlantic 19 hours,—our papers say only one hour, and as a whole made better time than the Asia. We shall know which is the best ship by this time next year. It would be well if we could obtain the results of the amount of fuel consumed, repairs, &c., by that time.

The Indiana Gold Region.

Dr. Brown, in a letter to Gov. Wright, of Indiana, says the gold region of that State extends from the falls of the Ohio, throughout a ridge of the highlands, which terminates on the Wabash River, between Attica and Covington. This ridge is the eastern boundary of the coal field of that State.

We are much obliged to Mr. Paine for a lithograph of his apparatus. We expect to receive a full and complete account of the whole process *some time* hence. We like to get all the light we can to make the Scientific American a No. 1 Pharos of Science and Art.

See the advertisement of Wood's Shingle Machine, in another column; we also call attention to our Burr Mill Stone advertisement; we are prepared to furnish them of the finest quality and at the lowest prices.

Dr. Henry Gratton Wirt, youngest son of the ate Wm. Wirt, of Maryland, died at Wirtland, near Monticello, Florida, on the 26th ultimo, of consumption.

Back Volumes Scientific American.

We are obliged to inform our patrons that complete sets of all the past Volumes are entirely exhausted. We have a few incomplete sets of Vols. 2 and 3, comprising about 50 Nos. of both Vols., which may be had by remitting one dollar, and we have sets of above 40 Nos. each of Vols. 3 and 4 which will be forwarded by mail an the receipt of one dollar for each set. Those desiring to secure Vol. 5 but have delayed subscribing at first, are advised to remit $2 without delay or they may be disappointed in getting a volume at all, should they wait until the Nos. are all published?

An Improved Straw Cutter.

We have for sale a most excellent Straw Cutter, constructed upon an entirely new and improved principle. It was left at this office by the inventor, who wished us to dispose of it for him. It is easily kept in order and executes very rapidly. Price $12, carefully boxed. Address Munn & Co.

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

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One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them for any price.

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Scientific Museum.

Lightning and Lightning Conductors.

(Prepared for the Scientific American.)

No. 4.—(Concluded.)

The wire rope, as a conductor, meets the objections urged against copper rods, as regards the shortness of the lengths in which that material can be obtained, and the consequent number of pieces and joints necessary in the formation of a conductor for a high building, as the rope can be produced in extremely long lengths; it is applied much more readily and with greater facility adapted to angles and other forms and surfaces; it is easier fixed and in much less time at a considerable less cost. It possesses all the enumerated conditions of a perfect and sufficient electric conductor, with the advantage of the method of applying chains, without the objections which attend that form of conductor. It only then remains to compare it with the metal strip or riband conductors. The copper wire rope as a marine conductor is preferable to any other; its chief advantages are the immense difference of expense between it and the strip or riband plan. The spars are not injured or in any way affected by its application, and the electrical discharge would be led down to the water instead of into and through the body of the vessel, and therefore remove all liability to explosion; it is, in fact, much superior to the riband plan, and obviates all the objections advanced against the common chain conductor.

Immense numbers of these conductors have been applied to buildings of every kind, in the British navy and in the merchant marine, and they have had the most severe and repeated tests with uniform success.

For buildings, square iron rods, twisted, have been successfully used and are highly esteemed; they are made to run along the eves of a large roof, branching up into spikes every few yards distant, and are attached to rods running up at both gables, and down into some moist place in the ground. The lightning conductors should be continuous—well connected together and lead into the moist earth. As some people may wonder after all, how to erect conductors—for houses it is better to have a wire, let it be ever so slender, than no conductor at all. There need be no fears of any person failing to put up a conductor, if care is taken to connect all the parts, and to have it braced in the wall, by glass, or some non-conducting substance; or by iron staples, taking care to have the staples bedded in dry plaster in the walls. Any person may get a number of copper or iron wires zinced, say three or four, twist them together and let them branch out at the top separately, and be pointed; bind them well to the wall, and a simple and good conductor is erected at a very small expense. The upper ends of the copper or iron wires, should be zinced at any rate, if the rest of them are not. This is done by melting zinc in an iron pot, along with some salamoniac, and dipping in the ends of the wires.—This is also the way to zinc (galvanize) iron plates.

A Chinese Art.

A remarkable and valuable Calcydona, which had been engraved in China, with a figure of the Venus of that empire, has been recently presented by a Captain Gaull to the Society of Antiquaries of London.

It is a very large peculiar stone; and Mr. Kœnig gave it as his opinion that nothing like it is known. The design is of little interest as a work of taste, but wonderful as a work of art and skill, from the amazing labor that must have been bestowed on the cutting of so hard a stone. The best seal engravers in England state that the work could not have been executed in that country—or, at all events not without extreme labor, for years.

Iron Mountain.

An iron mountain has been discovered in Wisconsin, the ore of which yields 90 per cent. of pure metal. It covers about forty acres. There is an abundance of wood and water power near it.

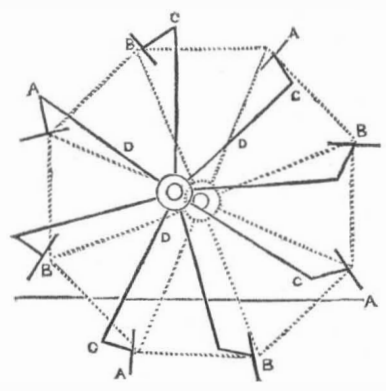
History of Propellers and Steam Navigation.

[Continued from page 352.]

MORGAN'S PADDLE WHEEL.

This paddle wheel is the invention of Elijah Galloway, the author of a history of the steam engine, and an inventor of a number of rotary engines. It is called Morgan's Wheel after the name of the assignee. It was invented about fifteen years ago, and has been applied to several of the Government vessels in England. The Mail Packets running to France have them, and their speed is said to be 25 per cent more than by the common wheel. A steamboat on the Clyde has been lately fitted with these wheels, and her speed has been increased two miles per hour—she had formerly the old paddle wheel. The object attained by Morgan's wheel is causing the paddles to enter and leave the water vertically, instead of at an angle. This prevents shocks and tends to increase the speed; but it is difficult to construct them—they are expensive and liable to get out of order. For long sea voyages they are held to be impracticable by eminent engineers, but for short and fair voyages, they are considered far superior to the common paddle wheel.

Fig. 72.



This figure represents the mechanism of the wheel; A A A A, &c., are the paddles which turn upon spindles, having a bearing in the angles of the framework of the wheel, B B B, and which is of a polygonal figure, with as many sides as it is required to have paddles. The inside frame or polygon is alone attached to the shaft of the engine, which does not continue beyond the side of the vessel; and the outer one has an independent bearing on a centre attached to the paddle box, so that it receives its motion entirely from the rim or angles of the polygon; by this means the space between the sides of the wheel is left entirely free. The part of the shaft or centre upon which the outer side of the wheel revolves, is projected in an inclined direction to the middle between the sides, but of course to a point considerably eccentric with the wheel.

Each paddle has a crank, C, attached to it at an angle of nearly ninety degrees, and rods, D D D, &c., connect the extremity of this crank with a movable boss which revolves upon the fixed eccentric point of the shaft.

It will thus be seen, that in consequence of the fixed point being situated out of the centre, the paddle will assume different positions during the revolution of the wheel, which positions can be so arranged as to differ very little from a vertical direction while passing the lower part of the revolution, or that part where the action of the paddle takes place.

Freezing Mixtures.

The application of heat from an external source is not always indispensible in order to liquefy solid bodies; many substances undergo this change of form if they merely come in contact with a liquid. Nearly all the crystallized salts possess this property. If a mixture be made of one of these salts with snow, or with some other liquid, the action of these substances on each other will convert one or both of them into liquids, one portion of their free caloric being consumed in effecting this change, as also a part of the heat of the vessels containing the mixture. The consequence is, that the greater the degree of cold generated during the liquifaction of mixture, the more quickly will the liquefication be brought about, and the greater will be the quantity of heat taken up, and rendered latent by the substances composing these freezing mixtures.

The following experiments will serve to illustrate the principles laid down above:

First Expt.—Place a thermometer in a glass, into which throw some finely-pulverized sulphate of soda (Glauber's Salts) and some chlorate of ammonia, or nitrate potassa (saltpetre)—Shake the mixture and the thermometer will indicate a considerable depression of the temperature.

Second Expt.—One part nitrate of ammonia and 1 of water at 50° mixed together produce a cold of 5°; or 5 parts of chlorate of ammonia, and 5 of nitrate of potassa, with 10 parts of water at 50°, lower the temperature to 10°.

These salts may crystallized again, and they will be equally available for use.

Third Expt.—Five parts of hydrochloric acid poured on 8 parts of freshly-pulverized sulphate of soda reduced the temperature from 50° to 1°,

Water placed in thin glass vessels or tubes, and set in the mixtures named in this and the preceeding experiment, is very quickly converted into ice.

Improvements in the Manufacture of Sugar.

An improvement in the manufacture of sugar, whereby all metalic oxides are dispensed with, and only simple lime used, has recently been discovered in France, which appears to be good, and deserves attention by those interested in the manufacture in America. The saccharine juice is obtained in the usual way from cane, or beets, and heated from 122° to 167°—the higher temperature for cold, and the lower for warm weather. To the juice so heated, a quantity of lime, previously slacked and sifted, is to be added, sufficient to separate the foreign matters capable of being coagulated by it. For every 100 gallons of juice the quantity of lime varies from 15 to 20 lbs. A sensible alkaline taste is an indication that sufficient lime has been added. The lime is well stirred and the temperature raised to 194°—care must be taken not to let it boil. This coagulates the foreign matters, some arise in scum, and others fall to the bottom as sediment. If the lime could be added to precipitate the foreign matters only, the sugar and the soluble salts would then be contained alone in the solution; but the sugar and lime unite and form a saccharate of lime and when this is formed, this part of the process is completed. The next thing to be done is to separate the sugar from the lime. This is effected by blowing into the juice by any convenient apparatus, a stream of carbonic acid gas, which may be obtained from the combustion of charcoal. This forms an insoluble carbonate of lime, which falls down to the bottom. An excess of the carbonic acid gas is thrown in, and the juice is then boiled to remove the free carbonic acid and the bi-carbonate of lime in the solution. The muddy liquor is then filtered, concentrated in the usual way and run into moulds. This makes a coarse sugar; to make finer sugar, the concentrated juice is filtered through charcoal, and run into moulds. The drainings of the sugar may be concentrated and filtered again, and will produce a good sugar. The *very* poorest drainings which contain some foreign matters, may be treated with lime as the raw juice, and then concentrated, filtered and run into moulds.

It is stated that this process produces a sugar fit for the market at one operation. It is a very simple process at least, and can easily be tested by our planters.

Waterspout.

The Pittsfield (Mass.) Sun says that this phenomenon, so rarely witnessed by denizens of the country, was presented on a magnificient scale on Friday July 5, at the commencement of the rain storm. It occurred between Pittsfield and Lanesborough, on the Pontoosuc Lake. The water ascended 100 feet and to such an extent that the water flowing over the dam of the Pontoosuc Manufacturing Company near the outlet, receded, and ran backwards into the lake.

During a thunder storm lately at Mobile, the electric fluid ran along the the wires into the telegraph office and destroyed two magnets.

A Corps of Sappers and Miners.

It is said that the extensive breaks in the Erie Canal, in New York, to repair which will cost the State $17,000, was produced solely through the agency of rats. On the bank stood a slaughter house, in which the rats burrowed, and in order to get to the water they undermined the embarkment and let the water in.

A list of steamboat casualties and the losses of life by them, during the present year, is published in the St. Louis Union of the 3d.—There have been sixty-seven boats lost by being blown up, collisions, fire, snaged, &c., causing the loss of four hundred killed and scalded, besides loss of property.

LITERARY NOTICES.

The Scalpel—A Journal of Health for popular and professional reading; edited by Dr. E.H. Dixion, a ready, pungent and forcible writer. Published quarterly at $1 per annum.—The number for August contains a brilliant series of articles among which are the following:—Hereditary Descent of Diseases, Consequences of Intermarriage of Blood Relations, Sketches of New York Physicians, A Dish for the Gods with Philosophy, and Garnished with the Gout; Treatment of the Cholera by Quinine; Dr. Bell's Lectures upon the same subject; Heroic Medical Education and Practice; Hysteria—its power; Heroic Surgery; Extirpation of a Tumor—besides an abundance of Sharp Shots at the quacks—puff balls and soda powdered species. Glorious Scalpel! your visits are heartily welcome.

Sartain's Magazine of Literature and Art, August number: Dewitt & Davenport, Agents, Tribune Buildings, New York..—This number contains upwards of 20 embellishments, and a briliant series of contributions from the pens of our first authors. This magazine enjoys a well earned reputation and may be considered one of the finest publications in the world, for female reading.

Graham's Magazine, August number.—For sale by the same publishers; it contains "The Origin of Music," an elegant steel engraving by Tucker, "Paris Fashions," and a fine mezzotint of "The Sisters," by Welch. The number also contains articles from Bayard Taylor, Gilmore Simms, Mrs. Neal, C. J. Peterson, Miss Duval and several others of known merit. The typography is beautiful and the paper very fine.

Peterson's Ladies' National Magazine for August can be had of the New York Agents Messrs. Dewitt & Davenport Tribune Buildings. It contains five illustrations and several original articles of merit. This number is a good one.

Shakespear's Dramatic Works, No 20, Phillips, Sampson & Co., publishers, Boston; for sale by Dewitt and Davenport, price 25 cts. This number contains the second part of King Henry IV., embellished by an elegant steel engraving of Lady Northumberland. A more splendid edition of the works of the immortal bard has never been published.

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